cosides given in the usual nonnephrotoxic doses are not simply filtered by the glomerulus to pass unobstrusively down the collecting system. They accumulate and persist in renal cortical cells. How this process may be related to nephrotoxicity, how the quantitative aspects of the phenomenon may reflect relative nephrotoxicity, what effect aminoglycosides have on the metabolic machinery of the cell and how this might contribute to drug interactions harmful to renal function remain to be determined.

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Medicine and the Certainty of Change in the Coming Century

AS WE CLOSE the bicentennial year and embark upon the third century in the history of America as a nation, there are many uncertainties. In fact about the only thing that is certain is that there will be change. The President-elect has promised change and seems likely to do his best to bring it about. But beyond this it is evident enough that we are entering an era of change which is probably without precedent in history. And also without precedent, medicine finds itself at the focus of much of it.

The forces for change are awesome. Much, perhaps all of these, stem from scientific and technologic progress, which itself is always changing and thus spawning other changes—often most unpredictable ones. Profound societal changes are among these effects. Not only science and technology, but personal and public attitudes are changing, and the traditional social, economic and political systems of our society simply do not seem to be working as well as they did, or could or should. The core problem of our institutional systems seems to be an inability to adapt and adjust rapidly enough to the forces of change and their effects. The problem is inherent in the institutions of both the public and private sectors.

But the forces of change are not likely to slacken. Rather they will increase in both pace and extent. The reality of the closed biosphere is only just beginning to penetrate the national consciousness, and as this occurs during the coming century, there will be a recognition of a new kind of biological interdependence as prerequisite for health, well-being and quality of life for any, or for all. The idea that all life, whether physiological, social, economic or political, goes on within a biological framework, subject to biological law, will follow. And biological law says that every person is different, and that personal maturation and fulfillment are individual matters. It also says that health, well-being, fulfillment and quality of life for any person depends upon a healthy interaction with a physical and social environment which must also be healthy. Consequently, the person and the environment may be expected to assume greater importance in the years ahead, and this is a quantitative if not a qualitative change from what has been the case. It would seem certain therefore that the foreseeable future will bring not only scientific and technological, but social, economic and political change as well.

If substantial and increasingly rapid change is a certainty, then medicine should prepare not only to live with it, but where possible to guide it. Medicine has been a technological success and is now being almost swamped by the problems brought on by attempts to achieve a fair and even distribution of this success to the public. Doctors are still very high in the public esteem. The other great professions suffer by comparison; they are generally held in less esteem by the public.

But all is not well with medicine. It too is showing signs of failure to cope, of confusion and disarray, particularly in social, economic and political matters. It shares this weakness with much if not all of the whole health enterprise. It too lacks effective mechanisms of adapting quickly enough to change whether on the local, state or national level. It has failed to coordinate the technologic, social, economic and political strengths of the health enterprise and to bring

these to bear to identify and define the problems of health care delivery, health manpower training and the development and distribution of resources. It has not examined these problems and collected an appropriate data base of information such as any practicing physician would do in addressing a problem with a patient. Nor has it developed diagnosis and treatment plans in collaboration with others involved as would be the case with a problem in direct patient care. In short, and surprisingly enough, it never really has applied its own highly developed problem solving techniques to its own problems. And this has not been good either for medicine or for the public it serves.

But it is not yet too late. The problem solving techniques of medicine are uniquely adapted to changing situations, and changing situations will be characteristic of the foreseeable future of health, well-being, personal fulfillment and quality of life for America—and for the world. Perhaps a beginning has been made with the approach to tort reform in California. This was and is a social, economic and political problem. The chief complaint, soaring professional liability insurance rates, was obvious enough, and after some to-do, the true nature and scope of the problem was identified by the House of Delegates of the California Medical Association as a social, economic and political ailment of modern American society, and not just of medicine and lawyers. The unprecedented step was taken of creating an independent commission on tort reform within which medicine, in collaboration with many others who are involved, could work to gather a data base, to refine the diagnosis and to prescribe a treatment program. The treatment, it is hoped, will match the dimensions of the problem, and have a broad enough base of support so that the ailment can be managed in a rational way which will lead to an eventual cure.

Rapid change will be a hallmark of third century America. We must learn to deal with this effectively within a framework of increasing interdependence, which will be another hallmark of the coming century. Medicine has much to offer the nation if it can begin to adapt its biological knowledge and its problem solving skills not only to the changing needs of patient care, but also to some of the changing social, economic and political problems of assuring health, well-being and quality of life for all the people.

—MSMW

Cell-Mediated Immunity — Resistance to Infection and So Much More

RECOGNITION of the participation of leukocytes, particularly phagocytic cells, in the host defense against infection has long antedated our understanding of the concept of specific immunity mediated by lymphoid cells against infectious agents. In turn, appreciation of cell-mediated immunity specifically directed against various microorganisms has led to greater insight into the potential and real importance that immunity mediated by cells holds in other diverse areas of human biology and clinical medicine.

In the current issue of the WESTERN JOURNAL Wing and Remington have clearly and succinctly outlined the diverse mechanisms and manifestations of immunity against a variety of microorganisms that are mediated directly or indirectly by thymus-derived (T) lymphocytes. Although many phases of the afferent as well as the efferent limb of the immune response are dependent on the participation of leukocytes of various classes, the term cell-mediated immunity is generally reserved for those processes under the direction of, or actually mediated by T cells. Yet, it is now becoming quite clear that such sharp dichotomies between different types of immune responses may not be entirely appropriate, given the cooperation and regulatory processes existing between lymphocyte subpopulations in the development of an effective immune response.[1,2]

In any event, evidence is now quite firm that cell-mediated immunity plays an important role in the manner in which the human host handles infection from a variety of organisms including several bacteria, fungi, viruses and parasites. Its importance to the survival of the host is clear. However, it has also become obvious over recent years that the infectious disease model of cell-mediated immunity has crossed the boundaries of most of the other subdivisions of clinical medicine and now forms the basis of our understanding of the pathophysiology of such diverse phenomena as immune rejection of tumor, autoimmune disease, rejection of allografts and the graft-versus-host reaction among others. The con-